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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,850	11/18/2003	Shinji Imai	Q78573	3707

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EXAMINER	
LEE, SHUN K	

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 10/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/714,850	IMAI ET AL.	
	Examiner	Art Unit	
	Shun Lee	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 May 2004 and 06 August 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *31,34 and 59-64* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *31,34,59,60,63 and 64* is/are rejected.

7)☒ Claim(s) *61 and 62* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 November 2003 and 06 August 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/534,204.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *0504*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on 6 August 2004. These drawings are acceptable.

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 31, 34, 60, 63, and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karellas (US 5,864,146) in view of Itoh *et al.* (US 4,597,012).

In regard to claims **31** and **63**, Karellas discloses (Fig. 37) an image read-out method of obtaining an image signal bearing thereon image information by use of a stimulable phosphor sheet (1306) having a layer of stimulable phosphor which emits stimulated emission in a wavelength range of not longer than 500 nm (column 35, lines 1-8) in proportion to the stored energy of radiation upon exposure to stimulating light (1310) in a wavelength range of not shorter than 600 nm (column 34, lines 54-63) and a solid image sensor (1312) having a photoconductive material layer whose major component is a-Se (*i.e.*, amorphous selenium; column 40, lines 1-9) which exhibits electric conductivity upon exposure to the stimulated emission from the stimulable phosphor sheet (1306) and by scanning (column 34, lines 54-56) with stimulating light (1310) a stimulable phosphor sheet (1306) which has been exposed to radiation and has stored thereon an image, causing the photoconductive material layer to be exposed to stimulated emission emitted from the stimulable phosphor sheet (1306) upon exposure to the stimulating light (1310), and using a solid image sensor (1312) whose photoconductive material layer also exhibits electric conductivity upon exposure to recording light bearing thereon image information or momentary light (*i.e.*, prompt scintillation; column 37, lines 8-21) emitted from the stimulable phosphor layer upon exposure to the recording light.

While Karellas also discloses (column 37, lines 8-21) obtaining a preliminary read-out image signal and an image signal by pixelated readout (column 40, lines 1-9)

of the amorphous selenium image sensor, the method of Karellas lacks an explicit description that the image sensor comprises a pair of electrode layers on opposite sides of the photoconductive material layer with one electrode layer divided into a stripe electrode comprising a first row of line electrode elements and the other electrode layer divided into a stripe electrode comprising a second row of line electrode elements each extending to intersect the line electrode elements of the first row and that the pixelated readout comprises detecting by the line electrode elements of the pair of electrode layers the electric charges generated in the photoconductive material layer upon exposure to the stimulated emission, the recording light, or the momentary light while simultaneously applying an electric field. However, pixelated readout of photoconductive image sensors is known in the art. For example, Itoh *et al.* teach (Figs. 2 and 3) that a photoconductive image sensor comprises a pair of electrode layers on opposite sides of the photoconductive material layer (3) with one electrode layer divided into a stripe electrode comprising a first row of line electrode elements (2) and the other electrode layer divided into a stripe electrode comprising a second row of line electrode elements (5) each extending to intersect the line electrode elements of the first row and that the pixelated readout (column 6, lines 25-45) comprises detecting by the line electrode elements of the pair of electrode layers the electric charges generated in the photoconductive material layer upon exposure to light while simultaneously applying an electric field (*i.e.*, supplying a voltage). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a conventional image sensor (*i.e.*, comprising a pair of electrode layers on opposite sides of the

photoconductive material layer with one electrode layer divided into a stripe electrode comprising a first row of line electrode elements and the other electrode layer divided into a stripe electrode comprising a second row of line electrode elements each extending to intersect the line electrode elements of the first row) as the image sensor in the method of Karellas and that pixelated readout occurs by detecting with the line electrode elements of the pair of electrode layers the electric charges generated in the photoconductive material layer upon exposure to light while simultaneously applying an electric field (*i.e.*, supplying a voltage), in order to obtain a preliminary read-out image signal and/or an image signal by pixelated readout of the amorphous selenium image sensor as taught by Karellas (column 37, lines 8-21; column 40, lines 1-9).

In regard to claims **34**, **60**, and **64**, Karellas discloses (Fig. 37) an image read-out system comprising a stimulating light source (1302) which emits stimulating light (1310), a stimulating light scanning means (column 34, lines 54-56) which causes the stimulating light (1310) emitted from the stimulating light source (1302) to scan a stimulable phosphor sheet (1306) having a layer of stimulable phosphor which emits stimulated emission in proportion to the stored energy of radiation upon exposure to the stimulating light (1310), a solid image sensor (1312) having a photoconductive material layer (*e.g.*, amorphous selenium; column 40, lines 1-9) which exhibits electric conductivity upon exposure to the stimulated emission from the stimulable phosphor sheet (1306), and an image signal obtaining means (column 40, lines 1-9) which detects electric charges generated in the photoconductive material layer of the solid image sensor (1312) when the stimulable phosphor sheet (1306) is exposed to the stimulating

light (1310) and stimulated emission emitted from the stimulable phosphor sheet (1306) impinges upon the photoconductive material, and detects an image signal representing an image stored on the stimulable phosphor sheet (1306), the photoconductive material layer of the solid image sensor (1312) also exhibits electric conductivity upon exposure to recording light bearing thereon image information or momentary light (*i.e.*, prompt scintillation; column 37, lines 8-21) emitted from the stimulable phosphor layer (1306) upon exposure to the recording light, and there is provided a preliminary read-out image signal obtaining means (column 37, lines 8-21) which obtains a preliminary read-out image signal bearing thereon image information by detecting charges when the recording light or the momentary light impinges upon the photoconductive material layer.

While Karellas also discloses (column 37, lines 8-21) obtaining a preliminary read-out image signal and an image signal by pixelated readout (column 40, lines 1-9) of the amorphous selenium image sensor, the system of Karellas lacks that the image sensor comprises a pair of electrode layers on opposite sides of the photoconductive material layer with one electrode layer divided into a stripe electrode comprising a first row of line electrode elements and the other electrode layer divided into a stripe electrode comprising a second row of line electrode elements each extending to intersect the line electrode elements of the first row and that the preliminary read-out image signal obtaining means (*i.e.*, pixelated readout) comprises detecting by the line electrode elements of the pair of electrode layers the electric charges generated in the photoconductive material layer upon exposure to the stimulated emission, the recording

light, or the momentary light with an electric field concurrently applied by an electric voltage imparting means. However, pixelated readout of photoconductive image sensors is known in the art. For example, Itoh *et al.* teach (Figs. 2 and 3) that a photoconductive image sensor comprises a pair of electrode layers on opposite sides of the photoconductive material layer (3) with one electrode layer divided into a stripe electrode comprising a first row of line electrode elements (2) and the other electrode layer divided into a stripe electrode comprising a second row of line electrode elements (5) each extending to intersect the line electrode elements of the first row and that the pixelated readout (column 6, lines 25-45) comprises detecting by the line electrode elements of the pair of electrode layers the electric charges generated in the photoconductive material layer upon exposure to light while simultaneously applying an electric field (*i.e.*, supplying a voltage). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a conventional image sensor (*i.e.*, comprising a pair of electrode layers on opposite sides of the photoconductive material layer with one electrode layer divided into a stripe electrode comprising a first row of line electrode elements and the other electrode layer divided into a stripe electrode comprising a second row of line electrode elements each extending to intersect the line electrode elements of the first row) as the image sensor in the system of Karellas and that pixelated readout occurs by detecting with the line electrode elements of the pair of electrode layers the electric charges generated in the photoconductive material layer upon exposure to light while simultaneously applying an electric field (*i.e.*, supplying a voltage with an electric voltage imparting means), in order

to obtain a preliminary read-out image signal and/or an image signal by pixelated readout of the amorphous selenium image sensor as taught by Karellas (column 37, lines 8-21; column 40, lines 1-9).

6. Claim 59 is rejected under 35 U.S.C. 103(a) as being unpatentable over Karellas (US 5,864,146) in view of Itoh *et al.* (US 4,597,012) as applied to claim 31 above, and further in view of Takahashi *et al.* (US 5,059,794).

In regard to claim **59** which is dependent on claim 31, the modified method of Karellas lacks that the electric field generates an avalanche amplification effect in the photoconductive material layer. Takahashi *et al.* teach (column 2, lines 18-22 and 47-58; column 6, lines 15-39) to apply an electric field to an a-Se photoconductive material layer sufficient for avalanche amplification in order to increase optical detection sensitivity when using a laser stimulable phosphor. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to apply an electric field in the modified method of Karellas sufficient for avalanche amplification, in order to increase optical detection sensitivity as taught by Takahashi *et al.*

Allowable Subject Matter

7. Claims 61 and 62 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: the instant application is deemed to be directed to an nonobvious improvement over the invention patented in US Patent 5,864,146. The improvement comprises in

combination with other recited elements, that a signal for activating line electrode elements of at least one of the pair of electrode layers are controlled to only partially overlap activation of line electrode elements disposed next to each other.

Response to Arguments

9. Applicant's arguments filed 6 August 2004 have been fully considered but they are not persuasive.

Applicant argues (pg 12 of remarks filed 6 August 2004) that Karellas relates to an image reading apparatus using a stimulable phosphor and an area-wide detector CCD array in preference to a scanning system. Examiner respectfully disagrees. Karellas states (column 37, lines 8-21) "Alternatively, the exposure level can be tracked by recording the prompt scintillation of the photostimulable phosphor. Many of these phosphors also produce light immediately as a response to the x-ray interactions. This light can be detected by the CCD in order to assess the level of the x-ray exposure, and this information can be used in a similar wy to provide exposure time information. Pixel binning can be used in all of the above techniques. The prompt scintillation can be used as an add-on to the final signal if desired, in order to increase the signal-to-noise ratio. If the photostimulable phosphor does not provide a strong prompt scintillation, a very thin coat of conventional phosphor can be applied on one side of the photostimulable phosphor, which will scintillate during the exposure" and (column 40, lines 1-9) that "After passing through wavelength-selective filter, stimulated fluorescence 1558 contacts electronic area detector 1594, which converts the pattern of stimulated fluorescence 1588 into representative electronic signals. Electronic area detector 1594

can be a CCD (front or back illuminated), a transparent gate CCD amorphous silicon pixelated plate, or amorphous selenium plate with pixelated readout. The detector can also be used with a proximity-type image intensifier". Thus Karellas relates to an image reading apparatus comprising an area-wide detector such as a CCD (front or back illuminated), a transparent gate CCD amorphous silicon pixelated plate, or amorphous selenium plate (*i.e.*, photoconductive material) with pixelated readout for detecting prompt scintillation from a stimulable phosphor.

Applicant argues (second paragraph on pg 13 of remarks filed 6 August 2004) that the Itoh *et al.* reference has no pertinence to the present invention. In response to applicant's argument that Itoh *et al.* is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Karellas discloses an image reading apparatus comprising an area-wide detector such as an amorphous selenium plate (*i.e.*, photoconductive material) with pixelated readout. These photoconductive detectors are known in the art (as exemplified by Itoh *et al.*). Therefore, the photoconductive detectors of both Karellas and Itoh *et al.* are pertinent to the particular problem with which the applicant was concerned.

In response to applicant's argument (third paragraph on pg 13 of remarks filed 6 August 2004) that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the

teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Karellas discloses an image reading apparatus comprising an area-wide detector such as an amorphous selenium plate (*i.e.*, photoconductive material) with pixelated readout. While Karellas does not provide a detailed description of the photoconductive detector, these photoconductive detectors are known in the art (as exemplified by Itoh *et al.*). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the amorphous selenium plate (*i.e.*, photoconductive material) with pixelated readout of Karellas is a known photoconductive detector such as the photoconductive detector described in more detailed by Itoh *et al.*

Applicant argues (last paragraph on pg 13 of remarks filed 6 August 2004) that the pertinent disclosures of the references teach away from their combination with each other since the gated electrode read out structure in Itoh *et al.* would be completely inappropriate for the CCD array of Karellas. Examiner respectfully disagrees. As discussed above, Karellas discloses an image reading apparatus comprising an area-wide detector such as an amorphous selenium plate (*i.e.*, photoconductive material) with pixelated readout. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the amorphous selenium plate (*i.e.*, photoconductive material) with pixelated readout of Karellas is a known

photoconductive detector such as the photoconductive detector described in more detailed by Itoh *et al.*

Applicant argues (first paragraph on pg 14 of remarks filed 6 August 2004) that the combination of the references does not teach each feature of claim 31 since Karellas specifically separates the recording and read-out. Examiner respectfully disagrees. As discussed above, Karellas discloses an image reading apparatus comprising an area-wide detector such as a CCD (front or back illuminated), a transparent gate CCD amorphous silicon pixelated plate, or amorphous selenium plate (*i.e.*, photoconductive material) with pixelated readout for detecting prompt scintillation from a stimulable phosphor. Therefore, Karellas specifically teaches detecting prompt scintillation during the recording in addition to during the read-out.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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